

RECEIVED
CENTRAL FAX CENTER
MAY 16 2008

-2-

Amendments to the Claims:

1. (Currently Amended) A two-shaft vacuum pump comprising:
first and second rotor shafts,
an electric drive motor which drives one of the ~~motor~~ rotor shafts, the
drive motor being a synchronous motor with a motor rotor that is permanently
5 excited, and
a synchronous motor power-limiting device which limits compression-
induced heating in the motor rotor to a constant value at speeds above a fixed rated
motor speed (R_N) motor power (P_M) to a fixed maximum motor power (P_{Mmax}) in a
limiting range above a fixed rated motor speed (n_N);
10 wherein above the fixed rated motor speed, a stator current is adjusted
such that motor torque (M_M) decreases reciprocally proportional to the motor speed as
the motor speed increases.
2. (Previously Presented) The two-shaft vacuum pump
according to claim 1, wherein the power-limiting device adjusts, in the limiting
range, a phase angle between a magnetic field of the rotor and an electrical stator field
to an angle other than 90° .
3. (Previously Presented) The two-shaft vacuum pump
according to claim 1, wherein the power-limiting device reduces the stator current in
the limiting range.
4. (Previously Presented) The two-shaft vacuum pump
according to claim 1, wherein the power-limiting device adjusts, in the limiting range,
the phase angle between the magnetic field of the rotor and at least one of the
electrical stator field and the stator current as a function of the motor speed.
5. (Previously Presented) The two-shaft vacuum pump
according to claim 1, wherein the driven rotor shaft driven by the drive motor is of
cantilevered configuration and is supported without a supporting bearing on a motor-
side end.

-3-

6. (Previously Presented) The two-shaft vacuum pump according to claim 1, wherein the motor rotor comprises a plurality of permanent magnets arranged on an outside surface of the motor rotor body.

7. (Previously Presented) The two-shaft vacuum pump according to claim 6, wherein the motor rotor comprises a rotor enclosure of a nonmagnetic material which externally encloses the motor rotor body and the plurality of permanent magnets.

8. (Previously Presented) The two-shaft vacuum pump according to claim 1, wherein on a stator side, a can of a nonmagnetic material is provided which gas-tightly seals the motor rotor with respect to the motor stator.

9. (Previously Presented) The two-shaft vacuum pump according to claim 8, wherein a pump cover holding the can and a stator casing are integrally formed.

10. (Previously Presented) The two-shaft vacuum pump according to claim 7, wherein at least one of the plurality of permanent magnets of the motor rotor include rare earth elements.

11. (Currently Amended) A two-shaft vacuum pump comprising:
a pair of ~~motor rotor~~ shafts;

a synchronous, permanently excited drive motor directly connected to one of the ~~motor rotor~~ shafts; and

5 a phase angle adjusting device which (a) below a rated motor speed, adjusts a phase angle between a motor rotor magnetic field and at least one of a motor stator magnetic field and a stator current ~~below a rated motor speed~~ and (b) at the rated motor speed (n_N), limits compression induced heating to a constant value by adjusting a stator current to fix ~~fixes~~ an applied motor power (P_{Mmax}) such that ~~the~~
10 ~~motor speed (n) increases with decreases in motor torque (M_M) decreases reciprocally proportional to motor speed with increasing motor speed.~~

-4-

12. (Previously Presented) The two-shaft vacuum pump according to claim 1, wherein the power limiting device:

holds the motor power (P_M) constant, when the motor (n) speed reaches the rated motor speed (n_N); and

5 in response to an increase in gas pressure in the vacuum pump which reduces a motor torque (M_M), continues to hold the motor power (P_M) constant increasing the motor speed (n) above the rated motor speed (n_N).

13. (Previously Presented) The two-shaft vacuum pump according to claim 1, wherein in the limiting range above the rated motor speed (n_N), the power limiting device holds the motor power (P_M).

14. (Previously Presented) The two-shaft vacuum pump according to claim 1, wherein in the limiting range above the rated motor speed (n_N), the power limiting device permits the motor speed (n) to increase above the rated motor speed (n_N), such that in response to heating attributable to an increase in gas
5 pressure in the vacuum pump, the motor speed increases and the motor torque (M_M) decreases.